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**PRE-APPEAL BRIEF REQUEST FOR REVIEW**

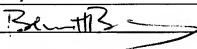
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960296.00129

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on 26 January 2010

Signature

Typed or printed name Bennett J. Berson

Application Number

10/688,416

Filed

October 17, 2003

First Named Inventor

David C. Schwartz

Art Unit

1637

Examiner

Stephanie K. Mummert

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).

Note: No more than five (5) pages may be provided.

I am the

☐

applicant/inventor.

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assignee of record of the entire interest.  
See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed.  
(Form PTO/SB/96)

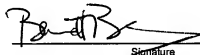
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attorney or agent of record.  
Registration number 37,094

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attorney or agent acting under 37 CFR 1.34.

Registration number if acting under 37 CFR 1.34 \_\_\_\_\_



Signature

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26 January 2010

Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below\*.

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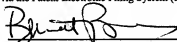
\*Total of \_\_\_\_\_ forms are submitted.

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Date of Signature and Deposit: January 5, 2010

  
Bennett J. Berson, Reg. No. 37,094

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: David C. Schwartz, *et al.*

Date: January 26, 2010

Serial No.: 10/688,416

Art Unit: 1637

Filing Date: October 17, 2003

Examiner: Stephanie K. Mummert

Title: MICRO-CHANNEL LONG MOLECULE MANIPULATION SYSTEM

Confirmation No.: 2216

File No.: 960296.00129

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**PRE-APPEAL BRIEF REQUEST FOR REVIEW**

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Mail Stop AF  
Commissioner for Patents  
P.O. Box 1450  
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**REQUEST FOR REVIEW**

In response to a final Office Action dated October 28, 2009, Applicants respectfully request consideration of the following remarks in connection with a Pre-Appeal Brief Request for Review. This paper accompanies a Notice of Appeal for the final Office Action and is being submitted before the filing of an appeal brief.

### **STANDING OF THE CLAIMS**

Claims 10, 32, and 50 have been cancelled; Claims 71-94 have been withdrawn from consideration; Claims 1-9, 11-31, 33-49, and 51-70 are pending and under consideration. Claims 19 and 41 are allowable if rewritten in independent form.

### **BRIEF SUMMARY OF THE INVENTION**

The claims under consideration are directed at methods of elongating, aligning, or separating polymeric molecules by (a) passing a polymeric molecule in a laminar-flowing liquid through a micro-channel sized to provide laminar flow having liquid flow lines all substantially parallel to each other along a full length of the micro-channel (b) controlling the flow of the liquid to cause elongation of the polymeric molecule within the laminar flow, and (c) periodically reversing the laminar flow to cause the polymeric molecule to hover in an elongated state. In an Office Action dated October 28, 2009, the Examiner in charge of the application commits clear error of law and of fact in rejecting the claims, as discussed below.

### **ARGUMENTS**

**1. Because it was legal error to reject the claims over patentably distinct U.S. Patent No. 7,049,074 and U.S. Patent No. 6,509,158, the obviousness-type double patenting rejections are improper.**

The Examiner rejected Claims 1, 4-7, 17, 25, 28-31, 39, 45-47, and 48 for alleged obviousness-type double patenting over Claim 1 of commonly-owned U.S. Patent No. 7,049,074 (Schwartz I), in view of Fuchs *et al.* The Examiner further rejected Claims 1, 3, 4-7, 17, 23-25, 27-31, 39, and 45-48 for alleged obviousness-type double patenting over Claims 1-2, 10, 12-13, 15-16, and 26-27 of commonly-owned U.S. Patent No. 6,509,158 (Schwartz II), in view of Fuchs *et al.*

The invention is patentably distinct from Schwartz I and II because neither document teaches or suggests periodically reversing the laminar flow to cause the polymeric molecule to hover in an elongated state. Schwartz I and II teach that the molecule is fixed on a planar surface, not hovering within the micro-channel. Schwartz I and II, therefore, not only do not teach or suggest, but are inconsistent with Applicants' invention. Schwartz I and II are also inadequate to render the pending claims obvious in view of Fuchs because Fuchs teaches or

suggests neither laminar flow, nor the periodic reversal of laminar flow through micro-channels, as recited by the claims.

The Examiner failed to demonstrate that Fuchs teaches laminar flow and improperly placed upon Applicants the burden of showing that Fuchs does not (Office Action dated October 28, 2009, page 20, third full paragraph). Also, the Examiner alleged that the double patenting rejection is proper because Schwartz I and II teach a method where the molecule is hovering prior to elongation and fixation (Office Action dated October 28, 2009, page 21, first paragraph). However, the claims recite "hover in an elongated state," not prior to elongation. The instant claims are patentably distinct from those of Schwartz I and II and the rejection for alleged obviousness-type double patenting is improper.

**2. Because it was factual error to assert that "stopping" is the same as "reversing" and that being "still" is the same as "hovering," the Examiner's anticipation and obviousness rejections are improper.**

The Examiner alleged that Fuchs anticipates Claims 1-3, 8-9, 11-12, 16-18, 25-27, 33-34, 38-40, 42, 48, 51-52, 56, 64, and 69, and that Claims 4-7, 13-15, 23-24, 28-31, 35-37, 45-47, 49, 53-55, 57, 60-61, 63, 65-68, and 70 are obvious over Fuchs in view of Chan. However, Fuchs lacks the step of periodically reversing the laminar flow to cause the polymeric molecule to hover in an elongated state (Response dated July 30, 2009, page 16, second paragraph). The Examiner admits that Fuchs merely teaches stopping the flow, not periodically reversing the flow, but alleged that "stopping" is the same as "reversing" (Office Action dated October 28, 2009, page 22, first paragraph). Further, the Examiner alleged that because the slowing or stopping of the flow causes the molecule to be "still," Fuchs teaches that the molecule is "hovering" (Office Action dated October 28, 2009, page 21, fourth paragraph).

"Slowing" or "stopping" the flow, as taught by Fuchs, is not equivalent to "periodically reversing" the flow, as claimed by Applicants. "Stopping" means that the forward movement is halted, while periodically reversing the flow indicates that the direction of the flow is inverted such that the movement continues in opposite directions at certain intervals of time. Similarly, a "still" molecule, as taught by Fuchs, is not equivalent to a molecule "hovering in an elongated state," as claimed by Applicants. In fact, paucity of any flow, as taught by Fuchs, likely causes the molecule to sink to the bottom of the micro-channel, which is inconsistent with the molecule

"hovering in an elongated state." In addition, Fuchs does not teach or suggest laminar flow, as discussed above. Because Fuchs teaches neither that the molecule hovers in an elongated state nor that laminar flow is periodically reversed, Fuchs does not teach "each and every element as set forth in the claim" (MPEP § 2131, *quoting* Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631 (Fed. Cir. 1987)). The Examiner, thus, failed to establish a *prima facie* case of anticipation.

The Examiner also failed to establish a *prima facie* case of obviousness because neither Fuchs nor Chan nor Bensimon, alone or in combination, suggest Applicants' invention. Fuchs does not teach or suggest several elements of the claimed invention, as detailed above. In addition, Fuchs cannot make obvious Applicants' invention because Fuchs teaches a solution entirely different from, and inconsistent with, Applicants' laminar flow hovering for elongating a molecule. Fuchs teaches aligning molecules through velocity gradients created along micro-channels that vary in width along their length (e.g., paragraph [0011]; [106]; FIG. 20, 21) and/or contain obstacles that create stagnation points (e.g., paragraph [0085]; FIG. 14). The Fuchs method is different from Applicants' method because the molecule does not hover in an elongated state and the velocity differential, rather than laminar flow, is effecting alignment. Further, the Fuchs liquid flow lines are not substantially parallel to each other along a full length of the micro-channel (Fuchs, abstract; FIG. 5; FIG. 6; FIG. 12) and, in some cases, flow lines are separated altogether (Fuchs, abstract; FIG. 14; FIG. 18).

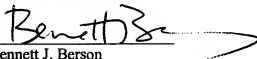
Neither Chan nor Bensimon bridge the gap between Fuchs and the claimed invention as neither document teaches or suggests periodically reversing the laminar flow to cause the polymeric molecule to hover in an elongated state. Further, neither document teaches that the flow lines are parallel to each other along the full length of the micro-channel. A combination of Fuchs, Chan, and Bensimon, thus, still does not teach or suggest Applicants' invention. Chan teaches measuring single molecule velocities. While Chan allegedly teaches certain limitations recited by selected dependent claims (Office Action dated January 30, 2009, page 15, fourth paragraph-page 17, third paragraph), Chan fails to overcome the shortcomings of Fuchs. Similarly, Bensimon merely teaches removing a coverslip to which a molecule is attached for analysis, not what is missing from Fuchs and Chan to meet Applicants' claims. Also, removing a coverslip does not make obvious to one of skill in the art removal of an elastic channel material

from the optical mapping surface after adsorption of the polymeric molecule, as recited in Applicants' claims 22, 44, and 59. Bensimon's two coverslips are not equivalent to a micro-channel and, therefore, Bensimon does not teach or suggest micro-channels in the first instance. Consequently, removing a coverslip does not make obvious removing an elastic channel material.

### CONCLUSION

Applicants submit that Claims 1-9, 11-31, 33-49, and 51-70 recite patentable subject matter deserving of a timely notice of allowance. Applicants have introduced no new matter in making the above remarks. No fees beyond the fees authorized in the accompanying Notice of Appeal are believed due in connection with the submission of this Pre-Appeal Brief Request for review; however, if any fees are due, in this or any subsequent response, please charge Deposit Account 17-0055.

Respectfully submitted,



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